

§ 23.1041

incorporated to reserve enough oil to operate the feathering system.

(b) The amount of reserved oil must be enough to accomplish feathering and must be available only to the feathering pump.

(c) The ability of the system to accomplish feathering with the reserved oil must be shown.

(d) Provision must be made to prevent sludge or other foreign matter from affecting the safe operation of the propeller feathering system.

[Doc. No. 4080, 29 FR 17955, Dec. 18, 1964, as amended by Amdt. 23-14, 38 FR 31823, Nov. 19, 1973; Amdt. 23-43, 58 FR 18973, Apr. 9, 1993]

COOLING

§ 23.1041 General.

The powerplant and auxiliary power unit cooling provisions must maintain the temperatures of powerplant components and engine fluids, and auxiliary power unit components and fluids within the limits established for those components and fluids under the most adverse ground, water, and flight operations to the maximum altitude and maximum ambient atmospheric temperature conditions for which approval is requested, and after normal engine and auxiliary power unit shutdown.

[Doc. No. 26344, 58 FR 18973, Apr. 9, 1993, as amended by Amdt. 23-51, 61 FR 5137, Feb. 9, 1996]

§ 23.1043 Cooling tests.

(a) *General.* Compliance with § 23.1041 must be shown on the basis of tests, for which the following apply:

(1) If the tests are conducted under ambient atmospheric temperature conditions deviating from the maximum for which approval is requested, the recorded powerplant temperatures must be corrected under paragraphs (c) and (d) of this section, unless a more rational correction method is applicable.

(2) No corrected temperature determined under paragraph (a)(1) of this section may exceed established limits.

(3) The fuel used during the cooling tests must be of the minimum grade approved for the engine.

(4) For turbocharged engines, each turbocharger must be operated through that part of the climb profile for which

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operation with the turbocharger is requested.

(5) For a reciprocating engine, the mixture settings must be the leanest recommended for climb.

(b) *Maximum ambient atmospheric temperature.* A maximum ambient atmospheric temperature corresponding to sea level conditions of at least 100 degrees F must be established. The assumed temperature lapse rate is 3.6 degrees F per thousand feet of altitude above sea level until a temperature of -69.7 degrees F is reached, above which altitude the temperature is considered constant at -69.7 degrees F. However, for winterization installations, the applicant may select a maximum ambient atmospheric temperature corresponding to sea level conditions of less than 100 degrees F.

(c) *Correction factor (except cylinder barrels).* Temperatures of engine fluids and powerplant components (except cylinder barrels) for which temperature limits are established, must be corrected by adding to them the difference between the maximum ambient atmospheric temperature for the relevant altitude for which approval has been requested and the temperature of the ambient air at the time of the first occurrence of the maximum fluid or component temperature recorded during the cooling test.

(d) *Correction factor for cylinder barrel temperatures.* Cylinder barrel temperatures must be corrected by adding to them 0.7 times the difference between the maximum ambient atmospheric temperature for the relevant altitude for which approval has been requested and the temperature of the ambient air at the time of the first occurrence of the maximum cylinder barrel temperature recorded during the cooling test.

[Doc. No. 4080, 29 FR 17955, Dec. 18, 1964, as amended by Amdt. 23-7, 34 FR 13094, Aug. 13, 1969; Amdt. 23-21, 43 FR 2319, Jan. 16, 1978; Amdt. 23-51, 61 FR 5137, Feb. 9, 1996]

§ 23.1045 Cooling test procedures for turbine engine powered airplanes.

(a) Compliance with § 23.1041 must be shown for all phases of operation. The airplane must be flown in the configurations, at the speeds, and following the procedures recommended in the